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☐ 1. Document ID: US 5997979 A Relevance Rank: 72

Entry 1 of 8 File: USPT Dec 7, 1999

DOCUMENT-IDENTIFIER: US 5997979 A
TITLE: Spherical annular seal member and method of manufacturing the same

BSPR:
In addition, in accordance with the present invention, the above object is also attained by a spherical annular seal member which has a cylindrical inner surface defining a through hole in a central portion thereof as well as an outer surface formed in the shape of a partially convex spherical surface, and which is used particularly in an exhaust pipe joint, comprising: a heat-resistant sheet member having on overall surfaces thereof a heat-resistant coating formed of aluminum phosphate; a reinforcing member made from a metal wire net, the reinforcing member and the heat-resistant sheet member being disposed in an interior portion of the spherical annular seal member which extends from the cylindrical inner surface to a vicinity of the outer surface formed in the shape of the partially convex spherical surface, and being arranged to be provided with structural integrality by being compressed and intertwined with each other; a sliding layer formed of a lubricating composition which is constituted of one of boron nitride and a mixture of boron nitride and polytetrafluoroethylene resin and at least one of alumina and silica, the sliding layer having an exposed surface which constitutes the outer surface formed in the shape of the partially convex spherical surface; and a reinforcing member disposed in the sliding layer and made from a metal wire net formed integrally with the sliding layer, wherein the outer surface formed in the shape of the partially convex spherical surface where the sliding layer and the reinforcing member made from the metal wire net formed integrally with the sliding layer in mixed form are exposed is formed into a smooth surface.

BSPR:
Furthermore, in accordance with the present invention, the above object is also attained by a method of manufacturing a spherical annular seal member which has a cylindrical inner surface defining a through hole in a central portion thereof as well as an outer surface formed in the shape of a partially convex spherical surface, and which is used particularly in an exhaust pipe joint, comprising the steps of: (a) preparing a heat-resistant sheet member having on overall surfaces thereof a heat-resistant coating having a uniform thickness and formed of aluminum phosphate; (b) preparing a reinforcing member made from a metal wire net obtained by weaving or knitting fine metal wires, superposing the reinforcing member on the heat-resistant sheet member, and convoluting a superposed assembly of the reinforcing member and the heat-resistant sheet member into a cylindrical shape with the heat-resistant sheet member placed on an inner side, so as to form a tubular base member; (c) preparing another heat-resistant sheet member having on overall surfaces thereof a heat-resistant coating having a uniform thickness and formed of

aluminum phosphate, and forming a sliding-surface forming member which includes the another heat-resistant sheet member, a sliding layer coated on a surface of the heat-resistant coating on one surface of the another heat-resistant sheet member and formed of a lubricating composition constituted of one of boron nitride and a mixture of boron nitride and polytetrafluoroethylene resin and at least one of alumina and silica, and a reinforcing member made from a metal wire net disposed in such a manner as to coat the sliding layer; (d) winding the sliding-surface forming member around an outer peripheral surface of the tubular base member with a sliding layer-side surface of the sliding-surface forming member facing an outer side, so as to form a cylindrical preform; and (e) fitting the cylindrical preform over an outer peripheral surface of a core of a die, placing the core into the die, and compression-forming the cylindrical preform in the die in an axial direction of the core, wherein, in an interior portion of an obtained spherical annular seal member, which extends from the cylindrical inner surface to a vicinity of the outer surface formed in the shape of the partially convex spherical surface, the heat-resistant sheet member having the heat-resistant coating and the reinforcing member made from the metal wire net are provided with structural integrality by being compressed and intertwined with each other, and the outer surface formed in the shape of the partially convex spherical surface is formed into a smooth sliding surface in which meshes of the reinforcing member are filled with the lubricating composition such that the reinforcing member and the lubricating composition are formed integrally in mixed form.

BSPR:
As a lubricating composition, an aqueous dispersion containing as a solid content 20 to 50 wt. % of a lubricating composition containing 70 to 90 wt. % of boron nitride and 10 to 30 wt. % of at least one of alumina and silica is used. As an alternative lubricating composition, an aqueous dispersion may be used which contains as a solid content 20 to 50 wt. % of a lubricating composition in which a lubricating composition containing 70 to 90 wt. % of boron nitride and 10 to 30 wt. % of at least one of alumina and silica is set as 100 parts by weight, and which further contains polytetrafluoroethylene resin in the proportion of not more than 200 parts by weight, preferably 50 to 150 parts by weight. The above-described aqueous dispersion of the lubricating composition is coated on the surface of the heat-resistant coating constituted of aluminum phosphate or a mixture in which at least one of graphite and the metal fluoride is mixed with aluminum phosphate, which is formed on the surface of the heat-resistant sheet member, by means of brushing, roller coating, spraying, or the like in the manufacturing method which will be described later. In a final compression process, the coating is spread into a uniform and very small thickness (10 to 300 .mu.m) on the outer surface formed in the shape of the partially convex spherical surface of the spherical annular seal member so as to form the lubricating sliding layer.

DEPR:
The tubular base member was fabricated by using a heat-resistant sheet member similar to the one used in the above-described Example 1 (a heat-resistant sheet member provided with the heat-resistant coating having a uniform thickness of 0.07 g/100 cm.sup.2 on the overall surfaces of the expanded graphite sheet). As another heat-resistant sheet member, in the same way as in the above-described Example 1, an expanded graphite sheet having a width of 48 mm, a length of 212 mm, and a thickness of 0.38 mm (the weight of the expanded graphite sheet being 4.2 g) was prepared separately, and the heat-resistant sheet member in which the heat-resistant coating with a uniform thickness of 0.07 g/100 cm.sup.2 was provided on the overall surfaces of the expanded graphite sheet was fabricated separately. Subsequently, an aqueous dispersion (25.5 wt. % of boron nitride, 4.5 wt. % of alumina, and 70 wt. % of water) containing as a solid content 30 wt. % of a lubricating composition (56.7 wt. % of boron nitride, 10 wt. % of alumina, and 33.3 wt. % of polytetrafluoroethylene resin), in which a lubricating composition constituted of 85 wt. % of boron nitride powder with an average particle size of 7 .mu.m and 15 wt. % of alumina powder with an average particle size of 0.6 .mu.m was set as 100 parts by weight, and which further contained 50 parts by weight of polytetrafluoroethylene resin powder with an average particle size of 0.3 .mu.m, was applied to the surface of the heat-resistant coating on one surface of the heat-resistant sheet member by means of roller coating, and was then dried. This coating operation was repeated three times to form the lubricating

sliding layer constituted by the lubricating composition. Then, a belt-shaped metal wire net, which was obtained by forming a cylindrical woven metal wire net similar to the aforementioned reinforcing member and by subsequently allowing this cylindrical woven metal wire net to be passed between the pair of rollers, was prepared separately. The heat-resistant sheet member having the lubricating sliding layer was inserted into the belt-shaped metal wire net, and an assembly thereof was passed between the pair of rollers so as to be formed integrally, thereby fabricating the sliding-surface forming member on one surface of which the reinforcing member and the lubricating composition filling the meshes of the reinforcing member were present in mixed form. Subsequently, the spherical annular seal member 54 was fabricated in the same method as the one used in Example 1. The weight ratio between the heat-resistant material composition constituted of the expanded graphite sheet and aluminum phosphate for forming the heat-resistant coating in this spherical annular seal member was 100 to 2.7 in terms of the ratio of the heat-resistant material to aluminum phosphate in the same way as in the above-described Example 1.

DEPR:
As the heat-resistant sheet member, an expanded graphite sheet similar to that of the above-described Example 1 and having a width of 48 mm, a length of 212 mm, and a thickness of 0.38 mm (the weight of the expanded graphite sheet being 4.2 g) was fabricated separately. By using a mixture similar to that of the above-described Example 7, the heat-resistant sheet member, in which the heat-resistant coating (the weight ratio between graphite and aluminum phosphate being 1:0.5) with a uniform thickness of 0.3 g/100 cm.sup.2 was formed on the overall surfaces of the expanded graphite sheet in the same method, was fabricated separately. Subsequently, an aqueous dispersion (17 wt. % of boron nitride, 10 wt. % of alumina, 10 wt. % of polytetrafluoroethylene resin, and 70 wt. % of water) containing as a solid content 30 wt. % of a lubricating composition (56.7 wt. % of boron nitride, 10 wt. % of alumina, and 33.3 wt. % of polytetrafluoroethylene resin), in which a lubricating composition constituted of 85 wt. % of boron nitride powder with an average particle size of 7 .mu.m and 15 wt. % of alumina powder with an average particle size of 0.6 .mu.m was set as 100 parts by weight, and which further contained 50 parts by weight of polytetrafluoroethylene resin powder with an average particle size of 0.3 .mu.m, was applied to the surface of the heat-resistant coating on one surface of the heat-resistant sheet member by means of roller coating, and was then dried. This coating operation was repeated three times to form the lubricating sliding layer constituted by the lubricating composition. Subsequently, the sliding-surface forming member was fabricated in the same way as in Example 1, and the spherical annular seal member was then fabricated in the same method as the one used in Example 1. The weight ratio between, on the one hand, the heat-resistant material composition constituted of the expanded graphite sheet and, on the other hand, graphite and aluminum phosphate for forming the heat-resistant coating in this spherical annular seal member was 100 to 11.5 in terms of the ratio of the heat-resistant material to the heat-resistant coating (7.7 for graphite and 3.8 for aluminum phosphate).

DEPR:
As the heat-resistant sheet member, an expanded graphite sheet similar to that of the above-described Example 1 and having a width of 48 mm, a length of 212 mm, and a thickness of 0.38 mm (the weight of the expanded graphite sheet being 4.2 g) was fabricated separately. By using a mixture similar to that of the above-described Example 7, the heat-resistant sheet member, in which the heat-resistant coating (the weight ratio between graphite and aluminum phosphate being 1:0.5) with a uniform thickness of 0.5 g/100 cm.sup.2 was formed on the overall surfaces of the expanded graphite sheet in the same method, was fabricated separately. Subsequently, an aqueous dispersion (17 wt. % of boron nitride, 10 wt. % of alumina, 10 wt. % of polytetrafluoroethylene resin, and 70 wt. % of water) containing as a solid content 30 wt. % of a lubricating composition (56.7 wt. % of boron nitride, 10 wt. % of alumina, and 33.3 wt. % of polytetrafluoroethylene resin), in which a lubricating composition constituted of 85 wt. % of boron nitride powder with an average particle size of 7 .mu.m and 15 wt. % of alumina powder with an average particle size of 0.6 .mu.m was set as 100 parts by weight, and which further contained 50 parts by weight of polytetrafluoroethylene resin powder with an average particle size of 0.3 .mu.m, was applied to the surface of the

heat-resistant coating on one surface of the heat-resistant sheet member by means of roller coating, and was then dried. This coating operation was repeated three times to form the lubricating sliding layer constituted by the lubricating composition. Subsequently, the sliding-surface forming member was fabricated in the same way as in Example 1, and the spherical annular seal member was then fabricated in the same method as the one used in Example 1. The weight ratio between, on the one hand, the heat-resistant material composition constituted of the expanded graphite sheet and, on the other hand, graphite and aluminum phosphate for forming the heat-resistant coating in this spherical annular seal member was 100 to 19.2 in terms of the ratio of the heat-resistant material to the heat-resistant coating (12.8 for graphite and 6.4 for aluminum phosphate).

CLPR:
10. A spherical annular seal member according to claim 1, wherein said lubricating composition further comprises polytetrafluoroethylene resin.

CLPR:
11. A spherical annular seal member according to claim 10, wherein said lubricating composition comprises 100 parts by weight of boron nitride and at least one of alumina and silica, and not more than 200 parts by weight of polytetrafluoroethylene resin.

CLPR:
12. A spherical annular seal member according to claim 10, wherein said lubricating composition comprises 100 parts by weight of boron nitride and at least one of alumina and silica, and 50-150 parts by weight polytetrafluoroethylene resin.

CLPR:
18. A spherical annular seal member according to claim 14, wherein said lubricating composition further comprises polytetrafluoroethylene resin.

CLPR:
19. A spherical annular seal member according to claim 18, wherein said lubricating composition comprises 100 parts by weight of boron nitride and at least one of alumina and silica, and not more than 200 parts by weight of polytetrafluoroethylene resin.

CLPR:
20. A spherical annular seal member according to claim 18, wherein said lubricating composition comprises 100 parts by weight of boron nitride and at least one of alumina and silica, and 50-150 parts by weight of polytetrafluoroethylene resin.

CLPR:
28. A spherical annular seal member according to claim 21, wherein said lubricating composition comprises 100 parts by weight of a sub-lubricating composition comprising 70-90 wt. % of boron nitride and 10-30 wt. % of at least one of alumina and silica, and not more than 200 parts by weight of polytetrafluoroethylene resin.

CLPR:
29. A spherical annular seal member according to claim 21, wherein said lubricating composition comprises 100 parts by weight of a sub-lubricating composition comprising 70-90 wt. % of boron nitride and 10-30 wt. % of at least one of alumina and silica, and 50-150 parts by weight of polytetrafluoroethylene resin.

CLPR:
33. A method of manufacturing a spherical annular seal member according to claim 31, wherein said sliding-surface forming member includes said heat-resistant sheet member having on the overall surfaces thereof said heat-resistant coating having a uniform thickness of 0.05-0.3 g/100 cm.sup.2 and formed of aluminum phosphate, said sliding layer formed of said lubricating composition constituted of one of boron nitride and the mixture of boron nitride and polytetrafluoroethylene resin and at least one of alumina and silica, and said reinforcing member made from the metal wire net disposed in such a manner as to coat said sliding layer.

CLPR:
39. A method of manufacturing a spherical annular seal member according to claim 34, wherein said sliding-surface forming member includes said heat-resistant sheet member having on the overall surfaces thereof said heat-resistant coating having a uniform thickness of 0.1-0.8 g/100 cm.sup.2 and formed of a mixture of graphite and aluminum phosphate with a weight ratio of 1:0.3-4, said sliding layer formed of said lubricating composition constituted of one of boron nitride and the mixture of boron nitride and polytetrafluoroethylene resin and at least one of alumina and silica, and said reinforcing member made from the metal wire net disposed in such a manner as to coat said sliding layer.

CLPR:
40. A method of manufacturing a spherical annular seal member according to claim 34, wherein said sliding-surface forming member includes said heat-resistant sheet member having on the overall surfaces thereof said heat-resistant coating having a uniform thickness of 0.1-0.8 g/100 cm.sup.2 and formed of a mixture of the metal fluoride and aluminum phosphate with a weight ratio of 1:0.3-4, said sliding layer formed of said lubricating composition constituted of one of boron nitride and the mixture of boron nitride and polytetrafluoroethylene resin and at least one of alumina and silica, and said reinforcing member made from the metal wire net disposed in such a manner as to coat said sliding layer.

CLPR:
41. A method of manufacturing a spherical annular seal member according to claim 34, wherein said sliding-surface forming member includes said heat-resistant sheet member having on the overall surfaces thereof said heat-resistant coating having a uniform thickness of 0.1-0.8 g/100 cm.sup.2 and formed of a mixture of graphite and the metal fluoride on the one hand, and aluminum phosphate on the other, with a weight ratio of 1:0.5-3, graphite and the metal fluoride being contained in a proportion of 50-80 wt. % for graphite and in a proportion of 20-50 wt. % for the metal fluoride, said sliding layer formed of said lubricating composition constituted of one of boron nitride and the mixture of boron nitride and polytetrafluoroethylene resin and at least one of alumina and silica, and said reinforcing member made from the metal wire net disposed in such a manner as to coat said sliding layer.

CLPR:
43. A method of manufacturing a spherical annular seal member according to claim 31, wherein said lubricating composition contains 100 parts by weight of a lubricating composition formed of 70-90 wt. % of boron nitride and 10-30 wt. % of at least one of alumina and silica, and further contains polytetrafluoroethylene resin in a proportion of not more than 200 parts by weight.

CLPR:
44. A method of manufacturing a spherical annular seal member according to claim 31, wherein said lubricating composition contains 100 parts by weight of a lubricating composition formed of 70-90 wt. % of boron nitride and 10-30 wt. % of at least one of alumina and silica, and further contains polytetrafluoroethylene resin in a proportion of 50-150 parts by weight.

CCOR:
428/66.4

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 2. Document ID: US 4147824 A Relevance Rank: 70

Entry 7 of 8 File: USPT Apr 3, 1979

DOCUMENT-IDENTIFIER: US 4147824 A
TITLE: Multilayer seals and method for their production and joining to seal carriers

BSPR:
The invention relates to disc-shaped or annular seals held by a seal carrier in valves which handle chemically aggressive substances. The seals to which this invention especially relates are multi-layer seals having a sealing surface consisting of PTFE (polytetrafluoroethylene) and an elastic lower layer. The invention further relates to a method of manufacture of seals of the above-described type as well as a method for joining seals of the type described to a seal carrier, i.e., a valve closing member or valve seat.

BSPR:
A further distinct object of the invention is to provide a method for joining seals such as previously described with a valve closure member or a valve seat, i.e., with a seal carrier. It is a particular object of the present invention to make such a joint simple and to avoid any threaded engagements, crimps or recess couplings. It is an additional object of the invention to provide an intimate joint between adjacent surfaces while conserving space and cost when compared to previously known methods for joining the seal to the seal carrier. These latter objects are attained, according to the invention, by producing the seal carrier in an injection molding step in which the seal is enveloped by the carrier material. In the injection molding step, the seal still contains the filling material which is later to be flushed out. When valves are used for handling aggressive substances, it would be advantageous to make the seal carrier element out of a resistant material, i.e., PTFE. However, the injection molding of PTFE is difficult and can be performed only under special and expensive conditions. Therefore, preferably, the seal carrier is made from an easily moldable PTFE variant, for example PFA (polytetrafluoroethylene with side chains of perfluroalkoxy), FEP (a copolymer of tetrafluoroethylene including hexafluoropropylene) or ETFE (ethylene-tetrafluoroethylene-copolymer). In a further development, the filler material is flushed out of the surface of the lower layer in those regions where it is to be surrounded by injection-molded material. The material used for the molding thus enters the pores which have been created by the flushing of the filler material and substantially improves the joint which the seal makes with the seal carrier and prevents any tearout or rupture of the seal from the valve closing member, e.g., when a stuck valve is opened. The fact that the injection molding material enters the pores of the lower layer also prevents any undesirable compression or deformation of the lower layer due to the injection molding pressure. In the molding process, the seal itself is placed in the mold as a kind of mold center and other elements may be inserted in the mold for providing access to lower parts of the seal which permits and enhances the flushing of the material which remains in the seal after molding. These voids which are created in the carrier material later permit a pressure equalization within the contiguous porous array in the lower layer of the seal. When pressed, the thickness of the lower layer is at least four times the dimension of the grain size of the filler material. If the injection molded material of the carrier has joined the seal properly, the overall characteristic of the seal is uniform and quasi-elastomeric. The covering foil of the seal is made at least 0.3 mm thick which is the minimum thickness that guarantees hermetic sealing.

CCOR:
428/66.4

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 3. Document ID: US 5147702 A Relevance Rank: 69

Entry 5 of 8 File: USPT Sep 15, 1992

DOCUMENT-IDENTIFIER: US 5147702 A
TITLE: Seal

BSPR:
The constituent materials currently used for seals in the place of asbestos include sheets of such general-purpose rubbers as styrene-butadiene rubber, acrylonitrilebutadiene rubber, butadiene rubber, and chloroprene rubber, sheets of urethane rubber, sheets of polytetrafluoroethylene, polytetrafluoroethylene-coated asbestos sheet, carbon fiber knit, and Alamides fiber knit, for example.

BSPR:
The seals made of general-purpose synthetic rubber sheets, among other materials mentined above, have an advantage that low pressure suffices for squeezing, satisfactory field workability is exhibited, a high contracting-resiling property is displayed, and an electric insulating property is manifested. They are, however, deficient in weatherability and in resistance to pressure. When these seals are applied to joints, for example, stainless steel or other similar metal forming the joints is corroded and suffered to sustain pinholes. The seals made of urethane rubber, similarly to those of general-purpose rubber sheets, have an advantage that low pressure suffices for squeezing, a high contracting-resiling property is displayed, an electric insulating property is manifested, and deformation occurs only slightly even under high pressure. They, however, are relatively expensive and are deficient in resistance to acids. The seals made of polytetrafluoroethylene sheet have an advantage that high resistance to chemicals and resistance to cold are exhibited and an electric insulating property is manifested. They however, possess poor elasticity, require high pressure for squeezing, and are expensive. The seals made of polytetrafluoroethylene-covered asbestos enjoy an excellent contracting-resiling property in addition to the advantage of the seals of polytetrafluoroethylene sheet mentioned above. They, however, are producible only in limited size and shape. Further, they prove to be disadvantageous because they inevitably incorporate therein asbestos, a substance those use is now enthusiastically discouraged by reason of danger to safety. The seals made of carbon fiber knit, though superior to asbestos in resistance to chemicals and softness, are inferior to asbestos in resistance to heat and are expensive. The seals made of Alamides fiber knit exhibit tensile strength and elasticity substantially equal to those of the seals of asbestos. They, however, are expensive.

CCOR:
428/66.4

☐ 4. Document ID: US 5879789 A Relevance Rank: 68

Entry 3 of 8 File: USPT Mar 9, 1999

DOCUMENT-IDENTIFIER: US 5879789 A
TITLE: Rigid sheet polytetrafluoroethylene gasket

ABPL:
An improved, chemically resistant gasket is constructed from a composite containing outer layers consisting essentially of conformable expanded polytetrafluoroethylene (PTFE) and interior layers consisting essentially of a densified expanded PTFE, wherein the composite layers may optionally contain electrically conductive fillers. The composite is bonded together to form a sheet material that is sufficiently conformable to provide good seal between surfaces and is sufficiently rigid to make the material easy to handle and install. The material of the present invention is particularly suitable for use as a gasket where rigidity is needed, customization or modification of gasket shape is desirable, and/or where a wide, even sealing surface is sought.

CLPV:
wherein the at least one inner layer of polytetrafluoroethylene material has a higher rigidity than the two outside layers of conformable expanded polytetrafluoroethylene material, and the gasket holds its shape during handling and installation while being sufficiently conformable to provide an effective seal between sealing surfaces.

CCXR:
428/66.4

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

5. Document ID: US 5874170 A Relevance Rank: 68

Entry 4 of 8 File: USPT Feb 23, 1999

DOCUMENT-IDENTIFIER: US 5874170 A
TITLE: Seal for movable structural components

ABPL:
A seal for movable structural components, such as piston rods or shafts, includes a carrier body made of plastics and a sealing member made of polytetrafluoroethylene (PTFE) material and bonded to the carrier body. A plastic material may be mixed with the PTFE and fused to the plastic carrier body during injection molding.

CLPV:
a sealing member made of polytetrafluoroethylene (PTFE) compound material which seals through contact with respect to one of said relatively movable structural components,

CCXR:
428/66.4

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

6. Document ID: US 5993931 A Relevance Rank: 68

Entry 2 of 8 File: USPT Nov 30, 1999

DOCUMENT-IDENTIFIER: US 5993931 A
TITLE: Hermetic solder lid closure

BSPR:
He absorption by Teflon RF connectors and optical fiber jacketing poses a difficulty in leak testing a hermetic seal to a LiNbO.sub.3 package. The present commercial practice that is used to address this problem involves drilling a hole through the lid prior to plating. Reflux solder is melted on the lid surface, after sealing, to create a closure. This may be used to allow outgassing of the package and not be used to test for hermeticity. Additionally, there has been used a crimp tube attached to the package which is then pinched off to create a closure.

CCXR:
428/66.4

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 7. Document ID: US 5112901 A Relevance Rank: 54

Entry 6 of 8 File: USPT May 12, 1992

DOCUMENT-IDENTIFIER: US 5112901 A
TITLE: Sealing elements and plain bearings formed from fiber-reinforced plastics

BSPR:
Seals, piston rings and bearing shells are used in hydraulics, pneumatics, mechanical engineering (for engines and compressors), machine-making, drive systems for aircraft and many other fields. Wherever exposure to high temperatures is likely, these elements customarily consist of materials such as metals, asbestos or graphite; but plastics have also already been used, e.g. polytetrafluoroethylene (PTFE) or polyoxymethylene (POM). PTFE withstands temperatures up to 300.degree. C. for a long time without undergoing chemical decomposition; nor is oxidative decomposition or thermal decomposition likely. However, PTFE seals are difficult to fabricate since PTFE is not thermoplastic. The specific manufacturing techniques required make PTFE components expensive. Moreover, putting PTFE components under pressure for a long time makes them deform by creeping. Creeping can be observed even at low pressures and low temperatures, e.g. at room temperature, when the time under load is long.

CCXR:
428/66.4

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 8. Document ID: US 3790432 A Relevance Rank: 52

Entry 8 of 8 File: USPT Feb 5, 1974

DOCUMENT-IDENTIFIER: US 3790432 A
TITLE: REINFORCED POLYQUINOXALINE GASKET AND METHOD OF PREPARING THE SAME

BSPR:
Development of nuclear-powered space vehicles utilizing liquid hydrogen systems requires the availability of gaskets and seals which are resistant to nuclear radiation and to liquid hydrogen temperatures. Composite gaskets based on fluorocarbon polymers have been developed previously for cryogenic applications in which conventional homogeneous polymeric gaskets are not suitable owing to the problems of cold flow, reduced flexibility and reduced compressibility encountered at cryogenic temperatures. Flurorocarbon polymers, however, do not possess sufficient resistance to radiation for use in the severe radiation environment of nuclear reactor systems. Various new polymers including polyimides and polybenzimidazoles show outstanding radiation resistance, but they do not have the flexibility or lubricity of fluorocarbons. In addition, the radiation-resistant polymers generally require complex high-temperature and high-pressure processing, and the reproducibility of fabrication methods in preparation of composites from such materials has been poor.

CCXR:
428/66.4

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☐ 13. Document ID: US 5449865 A Relevance Rank: 77

Entry 13 of 17 File: USPT Sep 12, 1995

DOCUMENT-IDENTIFIER: US 5449865 A
TITLE: Ear tips having molded-in recesses for attachment to a stethoscope

DEPR:
Preferably, the ear tip is molded from a silicone elastomer such as the silicone elastomer designated as "1940-50" by Shinetsu, available locally from Gym Tech of Grape Vine, Tex. Preferably the material used to construct the ear tip has a hardness of approximately 45 Shore A. Optionally, the ear tip may be coated with a teflon like material for improved friction and anti-static properties. The teflon-like material may be applied using commercially available techniques such as the monomer gas, plasma vacuum deposition process generally available from Plasma Etch of Long Beach, Calif. The ear tip of example 3 may be used with either stethoscope identified in examples 1 and 2.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 14. Document ID: US 5934336 A Relevance Rank: 77

Entry 7 of 17 File: USPT Aug 10, 1999

DOCUMENT-IDENTIFIER: US 5934336 A
TITLE: Multi-layer tubing assembly for fluid and vapor handling systems

BSPR:
Other high performance fluoropolymers, such as ethylene tetrafluoroethylene (ETFE), exhibit better cold impact-resistance but again, have experienced bonding problems. One approach in the art has been to pretreat the ETFE surface using methods such as chemical etching, plasma discharge or corona discharge. European Patent Application publication no. 0 551 094, for example, discloses a multi-layer tubing assembly in which an inner ETFE layer is treated by corona discharge to enhance bonding to an outer polyamide layer. Similarly, PCT international application WO 95/23036 treats an inner ETFE layer with plasma discharge to achieve better bonding with an outer thermosetting elastomer layer. In the same vein, U.S. Pat. No. 5,170,011 etches a fluorocarbon inner layer to promote better bonding with a polyamide outer layer. These approaches, too, have their problems. Pretreatment processes such as corona and plasma discharge are expensive and can be environmentally hazardous. Furthermore, in many cases (such as with corona treatment), only temporary bonding is achieved and delamination may occur with aging.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 15. Document ID: US 5976324 A Relevance Rank: 77

Entry 4 of 17 File: USPT Nov 2, 1999

DOCUMENT-IDENTIFIER: US 5976324 A
TITLE: Removal of water from reaction mixtures

BSPR:
In the preferred form, composite membranes which in general comprise several layers, that is to say a carrier layer, a porous layer and the actual separating layer, are employed. Possible carrier layers are in general highly porous flexible woven fabrics or nonwovens of fibers, including metal fibers, polyolefins, polysulfones, polyether-imides, polyphenyl sulfides or carbon; porous structures of glass, ceramic, graphite or metals are likewise suitable. The porous supporting layer preferably has an asymmetric pore structure. Such porous supporting layers can be prepared from, for example, polysulfone, polyether-sulfone, polyether-imide, polyvinylidene fluoride, hydrolized cellulose triacetate, polyphenylene sulfide, polyacrilonitrile, polyester, polytetrafluoroethylene, polyethylene, polyvinyl alcohol, copolymers of perfluorinated polyolefins and other suitable polymers. The molecular weights can likewise be in the range from 15,000 to 200,000. The actual separating layer can in turn comprise cellulose diacetate, cellulose triacetate, polyvinyl alcohol or a layer prepared by plasma polymerisation. Polyvinyl alcohol is crosslinked in the manner described above for better resistance to attack by water at higher temperatures. The membranes can be employed as a wound module, plate module, cushion module or hollow fiber or capillary module. Wound modules are particularly preferred.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 16. Document ID: US 5334464 A Relevance Rank: 63

Entry 14 of 17 File: USPT Aug 2, 1994

DOCUMENT-IDENTIFIER: US 5334464 A
TITLE: Lightweight battery plates

DEPR:
An important further refinement of the protective coating 18 or 16a on the positive side of the biplate is to provide an additional margin of non-conductive material around the edge of the battery 10 wherever the layers 16a or 18a would be in contact with the cell edge seal material. These features are illustrated in FIGS. 10(a), (b), and (c). Maintaining a leak-proof edge seal is critical to obtaining a long battery life because leakage of electrolyte will eventually result in shorts between the cells. Without this insulating margin, the seal material will be exposed to both the corrosive sulfuric-acid electrolyte and, wherever the seal directly contacts the conductive protective layer 16a or 18a on the positive side of core 12, will simultaneously be exposed to the oxidizing voltage potential. Just as no metallic elements and few metallic oxides can withstand this environment for long, there are also very few seal materials which are resistant to this environment. Notable exceptions are teflon and other fluorocarbons, which unfortunately, are also difficult to bond. Common seal materials such as epoxies, urethanes, and elastomers are not thermodynamically stable and, where exposed to this environment, will all eventually oxidize, degrade, and leak. By applying an insulating margin around the edge of the core 12, these common seal materials can be used successfully because they no longer are exposed to the destructive oxidizing electrical potential, and need only to tolerate the long-term exposure to the acid electrolyte environment. Thus, an alternative embodiment of the invention utilizes a material used in the margin around the edge of the biplate 10. The material is an insulator (conductivity less than 10.sup.-7 ohm.sup.-1 cm.sup.-1), which resists both the sulfuric acid electrolyte and the negative 1.75 volt oxidizing potential, and which is capable of being applied in a thin layer around the edge of the biplate wherever the biplate is in contact with the edge seal material. In general, it is envisioned that these insulating materials will be ceramics (i.e., non-conductive metal oxides) including but not limited to (undoped) stannic oxide or aluminum oxide. The application methods can be by vapor deposition (e.g., for stannic oxide), plasma spraying, or porcelainizing (as is commonly done on steel in the manufacture of household appliances). The thickness of the insulating material can be very thin (one micron) for vapor deposited coatings, to very thick (e.g., 0.030 inch) for fired porcelain edges.

☐ 17. Document ID: US 5645959 A Relevance Rank: 63

Entry 12 of 17 File: USPT Jul 8, 1997

DOCUMENT-IDENTIFIER: US 5645959 A
TITLE: Battery plates with self-passivating iron cores and mixed acid electrolyte

DEPR:
An important further refinement of the protective coating 18 or 16a on the positive side of the biplate is to provide an additional margin of non-conductive material around the edge of the battery 10 wherever the layers 16a or 18a would be in contact with the cell edge seal material. These features are illustrated in FIGS. 22, 23, and 24. FIG. 22 is a top view of a cell stack CSTK showing an insulating margin IMAR. The side view of the same cell stack CSTK depicted in FIG. 23 exhibits biplates separated by spacer frames SF and edge seals ESL. FIG. 24 reveals the details of the insulating material IMAT, sealant material SMAT and spacer frames SF surrounding a biplate. Maintaining a leak-proof edge seal ESL is critical to obtaining a long battery life because leakage of electrolyte EL will eventually result in shorts between the cells. Without an insulating margin IMAR, the edge seal material ESL will be exposed to both the corrosive sulfuric-acid electrolyte and, wherever the seal ESL directly contacts the conductive protective layer 16a or 18a on the positive side of core 12, will simultaneously be exposed to the oxidizing voltage potential. Just as no metallic elements and few metallic oxides can withstand this environment for long, there are also very few seal materials which are resistant to this environment. Notable exceptions are teflon and other fluorocarbons, which unfortunately, are also difficult to bond. Common seal materials such as epoxies, urethanes, and elastomers are not thermodynamically stable and, where exposed to this environment, will all eventually oxidize, degrade, and leak. By applying an insulating margin IMAR around the edge of the core 12, these common seal materials can be used successfully because they no longer are exposed to the destructive oxidizing electrical potential, and need only to tolerate the long-term exposure to the acid electrolyte environment. Thus, an alternative embodiment of the invention utilizes a material used in the margin around the edge of the biplate 10. The material is an insulator (conductivity less than 10.sup.-7 ohm.sup.-1 cm.sup.-1), which resists both the sulfuric acid electrolyte and the negative 1.75 volt oxidizing potential, and which is capable of being applied in a thin layer around the edge of the biplate wherever the biplate is in contact with the edge seal material. In general, it is envisioned that these insulating materials will be ceramics (i.e., non-conductive metal oxides) including but not limited to (undoped) stannic oxide or aluminum oxide. The application methods can be by vapor deposition (e.g., for stannic oxide), plasma spraying, or porcelainizing (as is commonly done on steel in the manufacture of household appliances). The thickness of the insulating material can be very thin (one micron) for vapor deposited coatings, to very thick (e.g., 0.030 inch) for fired porcelain edges.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

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☐ 1. Document ID: US 5726247 A Relevance Rank: 99

Entry 10 of 17 File: USPT Mar 10, 1998

US-PAT-NO: 5726247
DOCUMENT-IDENTIFIER: US 5726247 A

TITLE: Fluoropolymer nanocomposites

DATE-ISSUED: March 10, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Michalczyk; Michael Joseph	Wilmington	DE	N/A	N/A
Sharp; Kenneth George	Landenburg	PA	N/A	N/A
Stewart; Charles Winfield	Newark	DE	N/A	N/A

US-CL-CURRENT: 525/102; 428/421, 428/422, 525/104, 525/326.2, 525/326.4, 525/90

ABSTRACT:

This invention relates to a fluoropolymer nanocomposite comprising a fluoropolymer phase and an inorganic oxide phase dispersed throughout, said inorganic oxide phase having either no particles or particles substantially all of which have a particle size of less than about 75 nm which can be determined by small angle x-ray scattering and transmission electron microscopy techniques. These nanocomposites are useful as protective coatings.
40 Claims, 5 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 4

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 2. Document ID: US 5972435 A Relevance Rank: 99

Entry 5 of 17 File: USPT Oct 26, 1999

US-PAT-NO: 5972435
DOCUMENT-IDENTIFIER: US 5972435 A

TITLE: Method for forming film by plasma polymerization and apparatus for forming film by plasma polymerization

DATE-ISSUED: October 26, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Takai; Mitsuru	Nagano-ken	N/A	N/A	JPX
Miyazaki; Shinji	Saku	N/A	N/A	JPX
Ueda; Kunihiro	Saku	N/A	N/A	JPX
Kanazawa; Hiromichi	Saku	N/A	N/A	JPX

US-CL-CURRENT: 427/488; 118/50, 118/723E, 118/730, 427/131, 427/132, 427/255.5, 427/294, 427/569

ABSTRACT:

The present invention manifests a highly excellent effect of allowing the plasma polymerization film to be formed stably for a long time while very rarely suffering occurrence of abnormal discharge during the formation of the plasma polymerization film and promoting the improvement of the yield of products because it adopts as the electrode for implementing plasma polymerization that of the electrodes which is located on the side confronting a surface on which the plasma polymerization film is formed, coats this electrode with a polymer material at a covering ratio in the range of 50-100%, and effects the formation of the plasma polymerization film on an elongate substrate under the operating pressure in the range of 10.sup.-3 -1 Torr. Further, the properties of the plasma polymerization film also become highly excellent.
7 Claims, 5 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 5

☐ 3. Document ID: US 4647512 A Relevance Rank: 96

Entry 17 of 17 File: USPT Mar 3, 1987

US-PAT-NO: 4647512
DOCUMENT-IDENTIFIER: US 4647512 A

TITLE: Diamond-like carbon films and process for production thereof

DATE-ISSUED: March 3, 1987

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Venkataramanan; N.	Brookfield Center	CT	N/A	N/A
Zarowin; Charles B.	Rowayton	CT	N/A	N/A

US-CL-CURRENT: 428/688; 427/577

ABSTRACT:

Improved diamond-like carbon films of improved properties are deposited on various substrates utilizing a plasma assisted chemical vapor transport process (PACVT) process in which hydrogen is employed as the reactive process feedgas and in which the deposition process is conducted in a controllably energetic ion bombardment of the surface on which the films are grown by introducing the hydrogen feedgas into the reactor volume through a porous graphite electrode into a defined plasma geometry.
10 Claims, 4 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 4

☐ 4. Document ID: US 6002418 A Relevance Rank: 96

Entry 3 of 17 File: USPT Dec 14, 1999

US-PAT-NO: 6002418
DOCUMENT-IDENTIFIER: US 6002418 A

TITLE: Thermal head

DATE-ISSUED: December 14, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yoneda; Junichi	Shizuoka	N/A	N/A	JPX
Kashiwaya; Makoto	Kanagawa	N/A	N/A	JPX
Noshita; Taihei	Shizuoka	N/A	N/A	JPX

US-CL-CURRENT: 347/203

ABSTRACT:

The improved thermal head comprises heating elements which were provided with heating histories to previously change their resistance values by predetermined values; and a carbon-based protective layer which was formed after the heating elements were provided with the heating histories. The invention provides the thermal head in which corrosion and wear of the protective film, and the resistance variation of the heating elements due to thermal recording were significantly reduced, and which has a sufficient durability and stability with the passage of time to perform thermal recording of high-quality images in a consistent manner over an extended period of operation.
17 Claims, 5 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 4

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 5. Document ID: US 6025618 A Relevance Rank: 96

Entry 1 of 17 File: USPT Feb 15, 2000

US-PAT-NO: 6025618
DOCUMENT-IDENTIFIER: US 6025618 A

TITLE: Two-parts ferroelectric RAM

DATE-ISSUED: February 15, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Chen; Zhi Quan	Princeton	NJ	08540	N/A

US-CL-CURRENT: 257/295; 257/686, 257/688, 257/689, 257/778, 257/785, 29/830, 29/831, 361/735, 361/789, 361/790, 365/145, 365/164, 365/177, 365/65, 438/108 , 438/109

ABSTRACT:

A method of fabricating a complex IC in two parts and making the electrical connections between them afterwards is described. By this method, a ferroelectric RAM is fabricated in two parts, where the first part has an array of unit cells each of those has a transistor or a group of transistors serving the purpose of selecting one address for data recording and has an array of electrically conductive pads facing upward, protruding out from the surface of the first part, where the second part consists of a data-recording layer on another substrate. The data-recording layer consists of ferroelectric material and is pressed on the first part during data writing and reading.
7 Claims, 8 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 6. Document ID: US 5759329 A Relevance Rank: 81

Entry 9 of 17 File: USPT Jun 2, 1998

US-PAT-NO: 5759329
DOCUMENT-IDENTIFIER: US 5759329 A

TITLE: Fluoropolymer composite tube and method of preparation

DATE-ISSUED: June 2, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Krause; Edward	Ann Arbor	MI	N/A	N/A
Kuenzel; Kenneth J.	Grass Lake	MI	N/A	N/A
Woodward; Frederick	Dexter	MI	N/A	N/A

US-CL-CURRENT: 156/244.13; 156/244.17, 156/244.23, 156/244.24, 156/272.6, 264/171.12

ABSTRACT:

Described herein is a method of preparing a fluoropolymer composite tube comprising the steps of forming a fluoropolymer substrate, and thereafter layering and chemically bonding the fluoropolymer with a polymer layer, preferably a thermosetting or thermoplastic elastomer. The fluoropolymer substrate can be activated by subjecting the substrate to a charged gaseous atmosphere formed by electrically ionizing a gas which contacts the substrate. Thereafter, a layer of a thermosetting or thermplastic elastomer is applied to the activated fluoropolymer substrate resulting in a stronger chemical bond. The ionizing step can be described as a mixed gas plasma discharge or an electrically formed plasma. The thermosetting elastomer can, but does not have to contain a curing agent. In particular, this invention describes a fuel pipe comprised of an inner fluorocarbon layer having electrostatic discharge resistance and hydrocarbon evaporative emission resistance, and on top of and integral with the fluorocarbon layer, an outer layer of a thermosetting or thermoplastic elastomer chemically bonded to the fluorocarbon layer. Fluoropolymer layers have excellent chemical resistance.
10 Claims, 21 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 5

☐ 7. Document ID: US 5958532 A Relevance Rank: 81

Entry 6 of 17 File: USPT Sep 28, 1999

US-PAT-NO: 5958532
DOCUMENT-IDENTIFIER: US 5958532 A

TITLE: Fluoropolymer composite tube and method of preparation

DATE-ISSUED: September 28, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Krause; Edward	Ann Arbor	MI	N/A	N/A
Kuenzel; Kenneth J.	Grass Lake	MI	N/A	N/A

US-CL-CURRENT: 428/36.3; 138/141, 138/153, 138/174, 156/244.13, 156/244.17, 156/244.24, 156/272.6, 428/36.8, 428/36.9, 428/36.91, 428/421, 428/422

ABSTRACT:

Described herein is a method of preparing a fluoropolymer composite tube comprising the steps of forming a fluoropolymer substrate, and thereafter layering and chemically bonding the fluoropolymer with a polymer layer, preferably a thermosetting or thermoplastic elastomer. The fluoropolymer substrate can be activated by subjecting the substrate to a charged gaseous atmosphere formed by electrically ionizing a gas which contacts the substrate. Thereafter, a layer of a thermosetting or thermplastic elastomer is applied to the activated fluoropolymer substrate resulting in a stronger chemical bond. The ionizing step can be described as a mixed gas plasma discharge or an electrically formed plasma. The thermosetting elastomer can, but does not have to contain a curing agent. In particular, this invention describes a fuel pipe comprised of an inner fluorocarbon layer having electrostatic discharge resistance and hydrocarbon evaporative emission resistance, and on top of and integral with the fluorocarbon layer, an outer layer of a thermosetting or thermoplastic elastomer chemically bonded to the fluorocarbon layer. Fluoropolymer layers have excellent chemical resistance.
11 Claims, 21 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 5

☐ 8. Document ID: US 4935785 A Relevance Rank: 80

Entry 16 of 17 File: USPT Jun 19, 1990

US-PAT-NO: 4935785
DOCUMENT-IDENTIFIER: US 4935785 A

TITLE: Electrophotographic fuser roll and fusing process

DATE-ISSUED: June 19, 1990

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wildi; Eva A.	Webster	NY	N/A	N/A
Morrison; Ian D.	Webster	NY	N/A	N/A

US-CL-CURRENT: 399/324; 399/171, 399/327, 399/333, 427/466, 427/569, 430/124, 430/33 , 430/48

ABSTRACT:

Disclosed is a process for fusing an electrophotographic image to a substrate which comprises developing an electrostatic latent image with a toner of one polarity and contacting the developed image with a fuser roll having on the surface thereof an insulating material charged to the same polarity as the toner. In one embodiment of the invention, the surface of the fuser roll comprises an insulating material and the charge is applied with a charging means such as a corotron. In another embodiment of the invention, the surface of the fuser roll comprises a polymeric electret material having embedded therein stable electrical charges of the same polarity as that of the toner. For this second embodiment, the fuser roll may optionally be charged with a charging means. Additionally, the fuser roll may comprise a core of a resistive material that increases in temperature when the charging means is activated, which may reduce the amount of energy needed to heat the fuser roll, or may eliminate the need for other means of heating the fuser roll.
25 Claims, 4 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 4

☐ 9. Document ID: US 5722668 A Relevance Rank: 79

Entry 11 of 17 File: USPT Mar 3, 1998

US-PAT-NO: 5722668
DOCUMENT-IDENTIFIER: US 5722668 A

TITLE: Protective collar for vacuum seal in a plasma etch reactor

DATE-ISSUED: March 3, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Rice; Michael	Pleasanton	CA	N/A	N/A
Askarinam; Eric	Sunnyvale	CA	N/A	N/A

US-CL-CURRENT: 277/650; 118/723E, 277/913

ABSTRACT:

A vacuum seal assembly that can be used in a plasma etch reactor to seal the chamber interior from the outside environment consists of a protective collar that is injection molded or machined of a high strength, high temperature and corrosion resistant thermoplastic material, the collar has an elastomeric gasket installed therein and is used in combination with a second elastomeric gasket to achieve a fluid-tight seal between two rigid surfaces made of silicon and quartz, respectively.
4 Claims, 4 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 3

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 10. Document ID: US 4973816 A Relevance Rank: 78

Entry 15 of 17 File: USPT Nov 27, 1990

US-PAT-NO: 4973816
DOCUMENT-IDENTIFIER: US 4973816 A

TITLE: Plasma torch with safety switch

DATE-ISSUED: November 27, 1990

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Haberman; Randy G.	Burbank	CA	N/A	N/A

US-CL-CURRENT: 219/121.48; 219/121.51, 219/121.54, 219/75

ABSTRACT:

A plasma torch is provided with a safety switch which is connected in a circuit so as to control high voltage applied to the torch. The switch is held closed by the torch tip. When the tip is removed, as for service or replacement, the switch opens and disables the high voltage, so that personnel cannot accidentally be shocked.
9 Claims, 5 Drawing figures
Exemplary Claim Number: 4
Number of Drawing Sheets: 2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 11. Document ID: US 5931201 A Relevance Rank: 77

Entry 8 of 17 File: USPT Aug 3, 1999

US-PAT-NO: 5931201
DOCUMENT-IDENTIFIER: US 5931201 A

TITLE: Multi-layer tubing assembly for fluid and vapor handling systems

DATE-ISSUED: August 3, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hsich; Henry S.	Cary	NC	N/A	N/A

US-CL-CURRENT: 138/137; 138/140, 138/141, 138/DIG1

ABSTRACT:

A multi-layer tubing assembly for use in fuel-line applications. An extruded innermost semi-conductive layer of a fluoroplastic has a surface resistivity in the range of 10.sup.1 to 10.sup.6 ohm/sq. An inner permeation-resistant layer of a fluoroplastic is coextruded around the innermost layer at temperatures below 600 degrees Fahrenheit. An adhesive layer of polymer blend coextruded around the inner layer has a multiphase morphology wherein one phase is miscible with the fluoroplastic and another phase is miscible with a rubber-like multiphase polymer. A cover layer of the rubber-like multiphase polymer is coextruded around the adhesive layer.
33 Claims, 0 Drawing figures
Exemplary Claim Number: 26

☐ 12. Document ID: US 6012496 A Relevance Rank: 77

Entry 2 of 17 File: USPT Jan 11, 2000

US-PAT-NO: 6012496
DOCUMENT-IDENTIFIER: US 6012496 A

TITLE: Multi-layer tubing assembly for fluid and vapor handling systems

DATE-ISSUED: January 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hsich; Henry S.	Rochester Hills	MI	N/A	N/A
Su; Dean T.	Princeton Junction	NJ	N/A	N/A

US-CL-CURRENT: 138/137; 138/140, 138/141, 138/DIG.1

ABSTRACT:

A multi-layer tubing for use in fluid transport applications. The tubing is suitable for conveying fluids containing hydrocarbons. The tubing comprising an extrudable adhesive layer coextruded around a permeation-resistant layer of fluoropolymer and a layer of polymer chemically dissimilar from fluoropolymer coextruded around the adhesive . The adhesive layer is formed of a polymer blend or alloy having a multi-phase morphology wherein one phase is miscible with the fluoropolymer for forming the inner permeation-resistant layer and another phase is miscible with the polymer chemically dissimilar from fluoropolymer.

To achieve sufficient bonding, the adhesive layer comprises at least 25% volume fraction of the first phase which is miscible with the fluoropolymer for forming inner permeation-resistant layer and at least 25% volume fraction of the second phase which is miscible with the polymer chemically dissimilar from fluoropolymer.

Furthermore, the adhesive layer of polymer blends or alloys having a multi-phase morphology can be modified by adding compatibilizers and rheology modifiers to improve adhesion strength and to allow the material for forming the adhesive layer to obtain proper viscosity and elasticity for extrusion.
26 Claims, 0 Drawing figures
Exemplary Claim Number: 12

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☐ 13. Document ID: US 5449865 A Relevance Rank: 77

Entry 13 of 17 File: USPT Sep 12, 1995

US-PAT-NO: 5449865
DOCUMENT-IDENTIFIER: US 5449865 A

TITLE: Ear tips having molded-in recesses for attachment to a stethoscope

DATE-ISSUED: September 12, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Desnick; Mandel L.	St. Louis Park	MN	N/A	N/A
Kompelien; Brian J.	Anoka	MN	N/A	N/A

US-CL-CURRENT: 181/131; 181/135

ABSTRACT:

A stethoscope having a binaural with dual sound-transmitting tubes adapted to deliver sound to a human ear, with each tube having an ear tip connection end having a plurality of flanges thereon. Removably attached to the described tubes are a pair of ear tips formed of a non-porous elastomeric material having a channel therein having a plurality of molded-in recesses adapted to engage the flanges in complementary fashion.
20 Claims, 7 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 3

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 14. Document ID: US 5934336 A Relevance Rank: 77

Entry 7 of 17 File: USPT Aug 10, 1999

US-PAT-NO: 5934336
DOCUMENT-IDENTIFIER: US 5934336 A

TITLE: Multi-layer tubing assembly for fluid and vapor handling systems

DATE-ISSUED: August 10, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hsich; Henry S.	Cary	NC	N/A	N/A

US-CL-CURRENT: 138/137; 138/140, 138/141, 138/DIG1

ABSTRACT:

A multi-layer tubing assembly for use in fuel-line applications. An extruded innermost semi-conductive layer of ethylene tetrafluoroethylene has a surface resistivity in the range of 10.sup.1 to 10.sup.6 ohm/sq. An inner permeation-resistant layer of soft ethylene tetrafluoroethylene is coextruded around the innermost layer at temperatures below 600 degrees Fahrenheit. An adhesive layer of polymer blend coextruded around the inner layer has a multi-phase morphology wherein one phase is miscible with ethylene tetrafluoroethylene and another phase is miscible with polyamide. An outer layer of nylon 12 is coextruded around the adhesive layer.
19 Claims, 0 Drawing figures
Exemplary Claim Number: 17

☐ 15. Document ID: US 5976324 A Relevance Rank: 77

Entry 4 of 17 File: USPT Nov 2, 1999

US-PAT-NO: 5976324
DOCUMENT-IDENTIFIER: US 5976324 A

TITLE: Removal of water from reaction mixtures

DATE-ISSUED: November 2, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Groschl; Andreas	Leverkusen	N/A	N/A	DEX
Winkler; Adolf	Leverkusen	N/A	N/A	DEX
Bremen; Josef	Leverkusen	N/A	N/A	DEX

US-CL-CURRENT: 203/14; 159/DIG27, 203/15, 203/18, 203/29, 203/39, 203/86, 210/500.26 , 210/500.27, 210/500.31, 210/500.32, 210/500.38, 210/500.39, 210/500.41, 210/640, 568/916

ABSTRACT:

A process as been found for the removal of water from reaction mixtures of acids or acid anhydrides or of aqueous alkali metal hydroxide solutions with alcohols using vapor permeation/pervaporation at the boiling point of the reaction mixture, which includes initially introducing the lowest-boiling educt in less than the stoichiometric amount, based on the other particular educt, together with this other educt, heating the reaction mixture to the boiling point and freeing the vapor mixture, which is formed from the boiling reaction mixture and includes chiefly water and the lowest-boiling component, from water on a membrane, recycling the vapor mixture which has been freed from water into the reaction mixture and topping up the reaction mixture with the lowest-boiling educt in the course of the reaction.
16 Claims, 0 Drawing figures
Exemplary Claim Number: 1

☐ 16. Document ID: US 5334464 A Relevance Rank: 63

Entry 14 of 17 File: USPT Aug 2, 1994

US-PAT-NO: 5334464
DOCUMENT-IDENTIFIER: US 5334464 A

TITLE: Lightweight battery plates

DATE-ISSUED: August 2, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Rowlette; John J.	Monrovia	CA	N/A	N/A

US-CL-CURRENT: 429/210; 429/245

ABSTRACT:

The Lightweight Battery Plates disclosed and claimed in this patent application solve the problems encountered by previous attempts to construct practical bipolar plates for lead-acid batteries. One of the preferred embodiments of the present invention comprises a novel combination of a self-repairing substrate (12) surrounded by a lead coating (16a & 16b) resulting in a bipolar plate (10A) which is nearly three times lighter than its pure lead counterpart. Since this innovative plate incorporates a core or substrate (12) that is self-passivating under the electrical potential and highly acidic conditions found in the lead-acid battery, any pinholes, gaps, or flaws in the lead coatings (16a & 16b) are naturally resealed. Another preferred embodiment utilizes a coating of a semi-conducting metal oxide (18), such as fluorine-doped stannic oxide, on the positive side of the bipolar plate (10B) instead of lead, which further reduces the weight. Alternative embodiments may utilize aluminum or aluminum alloy substrates, which can further lighten the plate but will forfeit its self-repairing quality.
42 Claims, 24 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 11

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 17. Document ID: US 5645959 A Relevance Rank: 63

Entry 12 of 17 File: USPT Jul 8, 1997

US-PAT-NO: 5645959
DOCUMENT-IDENTIFIER: US 5645959 A

TITLE: Battery plates with self-passivating iron cores and mixed acid electrolyte

DATE-ISSUED: July 8, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Rowlette; John J.	Monrovia	CA	N/A	N/A

US-CL-CURRENT: 429/210; 429/188, 429/245

ABSTRACT:

The Battery Plates with Self-Passivating Iron Cores and Mixed Acid Electrolyte disclosed and claimed in this patent application solve the problems encountered by previous attempts to construct practical bipolar plates for lead-acid batteries. One of the preferred embodiments of the present invention comprises a novel combination of a self-repairing substrate (12) surrounded by a lead coating (16a & 16b) resulting in a bipolar plate (10A) which is nearly three times lighter than its pure lead counterpart. Since this innovative plate incorporates a core or substrate (12) that is self-passivating under the electrical potential and highly acidic conditions found in the lead-acid battery, any pinholes, gaps, or flaws in the lead coatings (16a & 16b) are naturally resealed. Another preferred embodiment utilizes a coating of a semi-conducting metal oxide (18), such as fluorine-doped stannic oxide, on the positive side of the bipolar plate (10B) instead of lead, which further reduces the weight. The self-passivation of the central core is enhanced by combining phosphoric or boric acid with the sulfuric acid electrolyte used in the battery.
15 Claims, 24 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 11

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☐ 1. Document ID: US 5726247 A Relevance Rank: 99

Entry 10 of 17 File: USPT Mar 10, 1998

DOCUMENT-IDENTIFIER: US 5726247 A
TITLE: Fluoropolymer nanocomposites

DEPR:
All reactions with air-sensitive materials were carried out in a Vacuum Atmospheres Co. dry box or under nitrogen. In the examples that follow, all commercial reagents were distilled prior to use. Tetrachlorosilane, trichlorosilane, vinyltrichlorosilane, allyltrichlorosilane 1,3,5,7-tetramethylcyclotetrasilane, tetrakis(dimethylsiloxy)-silane, 1,1,3,3-tetramethyldisiloxane, and pentamethylcyclopentasiloxane and trifluoroacetic acid were purchased from Aldrich Chemical Co., Milwaukee, Wisc., United Techologies Inc., Bristol, Pa. or PCR Inc., Gainesille, Fla. Si(OCH.sub.2 CF.sub.3).sub.4, Si(OCH.sub.2 (CF.sub.2)CF.sub.3).sub.4, HSi(OCH.sub.2 CF.sub.3).sub.3, and CH.sub.2 .dbd.CHSi(OCH.sub.2 CF.sub.3).sub.3 were synthesized by slight modifications of published procedures. Platinum divinylsiloxane complex (3-3.5% Pt concentration in xylene, Huls PC.sub.072) was obtained from Huls America inc. and diluted 5:1; by volume (toluene, Pt complex) prior to use. Toluene was reagent grade and purified by distillation from calcium hydride prior to use. Tetraallylsilane was snythesized by a modification of a published procedure (J. Organomet. Chem., 84(1975), pg 199-229). Vinylpolyfluoroalkanes; trans-divinylperfluoro-1,3-dioxolanes; all of the "TEFLON" AF, "TEFLON" FEP, and "KALREZ" fluoropolymers; zirconia, crystalline Nylon 6,6; "NOMEX" aramid paper, oxygen plasma-treated "MYLAR" polyester film; "KAPTON" polyimide film; silicone rubber; "NORDEL" rubber, "VAMAC" elastomer, or "VITON" elastomer, polymethylmethacrylate; copper and brass were obtained from E. I. du Pont de Nemours and Company, Wilmington, Del. "CHEMREZ" elastomer, EPDM rubber and nitrile rubber were obtained from Greene, Tweed and Co., Kulpville, Pa. Gold sputtering was performed using a Denton Vacuum Desk II sputterer (Cherry Hill, N.J.) with a sputtering time of 360 seconds. "FLUTEC" and "FLUORINERT" solvents were obtained from PCR, inc., Gainsville, Fla. "FLUTEC" solvent is also available from Rhone-Poulenc in France. The mass spectroscopy experiments were performed on a Finnigan 4615B GC/MS quadrupole mass spectrometer (San Jose, Calif.). An electron impact source configuration operating at 200.degree. C. and a source pressure of 1.0.times.10.sup.-6 Torr was used. The mass spectrometer was scanned at a rate of about 1000 Daltons/second. All mass spectral peaks are recorded as the sum of the ion plus potassium (M+39). Proton and carbon NMR were determined in deuterobenzene solvent on a GE model QE-300 instrument.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Image

☐ 2. Document ID: US 5972435 A Relevance Rank: 99

Entry 5 of 17 File: USPT Oct 26, 1999

DOCUMENT-IDENTIFIER: US 5972435 A
TITLE: Method for forming film by plasma polymerization and apparatus for forming film by plasma polymerization

DEPR:
As preferred concrete examples of the polymer material for the coating, such resins as fluorine-containing resins, polyamide, polycarbonate, polyacetal, polyimide, polyether ether ketone, polyphenylene sulfide, polybenzimidazole, polyethylene, polyvinyl chloride, polystyrene, polypropylene, methacryl resin, petroleum resin, polyvinylidene chloride, polycycloolefin, phenol resin, urea resin, (un)saturated polyester, polyurethane, alkyd resin, melamine resin, epoxy resin, ABS resin, BS resin, and AS resin and plasma polymers of organic compounds may be cited. Among them, the fluorine-containing resins, methacryl resin, polyester, polyurethane, epoxy resin, and plasma polymers of organic compounds may be particularly cited.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 3. Document ID: US 4647512 A Relevance Rank: 96

Entry 17 of 17 File: USPT Mar 3, 1987

DOCUMENT-IDENTIFIER: US 4647512 A
TITLE: Diamond-like carbon films and process for production thereof

DEPR:
Upper electrode 50, spacer 52 and support member 54 are retained in place by circumferential gas flow control ring 100, axial substrate holding ring 60, and upper axial plasma confinement ring 62 located axially between upper electrode 50 and side wall 40 and supported by lower axial shoulder member 41 on side wall 40. Inner axial wall 62A of plasma confinement ring 62 abuts against the outer circumference of support member 54, spacer 52 and upper porous electrode 50 while outer axial wall 62B of said ring 62 abuts the inner surface 40A of wall 40. Similarly, inner axial wall 60A of substrate holding ring 60 abuts the outer circumference of electrode 50 and the outer axial wall 60B of said ring 60 abuts the inner surface 40A of wall 40. Plasma confinement ring 62, substrate holding ring 60 and gas flow control ring 100 are formed of chemically inert, non-conducting material, preferably Teflon elastomer. These rings permit maintenance of a constant plasma volume which is necessary for achieving the required ion energies at the higher operating pressures employed in this invention. Plasma confinement ring 62 and substrate holding ring 60 are in sealing arrangement by means of axial O-ring 64.

DEPR:
Located circumferentially on substrate holding ring 60 and projecting downwardly from the lower surface 61 thereof is a plurality of spring loaded leveling buttons 63, preferably of Teflon elastomer, for maintaining a constant distance between the two electrode in the plasma reactor; preferably a distance of about 0.5 cm.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 4. Document ID: US 6002418 A Relevance Rank: 96

Entry 3 of 17 File: USPT Dec 14, 1999

DOCUMENT-IDENTIFIER: US 6002418 A
TITLE: Thermal head

DEPR:
Those sites of the vacuum chamber 102 where plasma develops or an arc is produced by plasma generating electromagnetic waves may be covered with an insulating member, which may be made of insulating materials including MC nylon, Teflon (PTFE), polyphenylene sulfide (PPS), polyethylene naphthalate (PEN) and polyethylene terephthalate (PET). If PEN or PET is used, care must be taken to insure that the degree of vacuum will not decrease upon degassing of such insulating materials.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 5. Document ID: US 6025618 A Relevance Rank: 96

Entry 1 of 17 File: USPT Feb 15, 2000

DOCUMENT-IDENTIFIER: US 6025618 A
TITLE: Two-parts ferroelectric RAM

DEPR:
For example, a plasma discharge is generated in a perfluoropropane (C.sub.3 F.sub.8)-argon gas mixture, by means of a capacity coupled diode system in which one electrode is grounded. The 13.56 Mhz RF power is coupled to the other electrode covered with gold, which is to be incorporated in the film. Gold is deposited on the substrate, which lies on the grounded electrode, by sputtering. Fluorocarbon elastomer layer is plasma deposited on the substrate at the same time, by plasma polymerization. After adequate thickness of the film is obtained, a patterning method is employed to obtain the conductive elastic pads.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 6. Document ID: US 5759329 A Relevance Rank: 81

Entry 9 of 17 File: USPT Jun 2, 1998

DOCUMENT-IDENTIFIER: US 5759329 A
TITLE: Fluoropolymer composite tube and method of preparation

ABPL:
Described herein is a method of preparing a fluoropolymer composite tube comprising the steps of forming a fluoropolymer substrate, and thereafter layering and chemically bonding the fluoropolymer with a polymer layer, preferably a thermosetting or thermoplastic elastomer. The fluoropolymer substrate can be activated by subjecting the substrate to a charged gaseous atmosphere formed by electrically ionizing a gas which contacts the substrate. Thereafter, a layer of a thermosetting or thermplastic elastomer is applied to the activated fluoropolymer substrate resulting in a stronger chemical bond. The ionizing step can be described as a mixed gas plasma discharge or an electrically formed plasma. The thermosetting elastomer can, but does not have to contain a curing agent. In particular, this invention describes a fuel pipe comprised of an inner fluorocarbon layer having electrostatic discharge resistance and hydrocarbon evaporative emission resistance, and on top of and integral with the fluorocarbon layer, an outer layer of a thermosetting or thermoplastic elastomer chemically bonded to the fluorocarbon layer. Fluoropolymer layers have excellent chemical resistance.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 7. Document ID: US 5958532 A Relevance Rank: 81

Entry 6 of 17 File: USPT Sep 28, 1999

DOCUMENT-IDENTIFIER: US 5958532 A
TITLE: Fluoropolymer composite tube and method of preparation

ABPL:
Described herein is a method of preparing a fluoropolymer composite tube comprising the steps of forming a fluoropolymer substrate, and thereafter layering and chemically bonding the fluoropolymer with a polymer layer, preferably a thermosetting or thermoplastic elastomer. The fluoropolymer substrate can be activated by subjecting the substrate to a charged gaseous atmosphere formed by electrically ionizing a gas which contacts the substrate. Thereafter, a layer of a thermosetting or thermplastic elastomer is applied to the activated fluoropolymer substrate resulting in a stronger chemical bond. The ionizing step can be described as a mixed gas plasma discharge or an electrically formed plasma. The thermosetting elastomer can, but does not have to contain a curing agent. In particular, this invention describes a fuel pipe comprised of an inner fluorocarbon layer having electrostatic discharge resistance and hydrocarbon evaporative emission resistance, and on top of and integral with the fluorocarbon layer, an outer layer of a thermosetting or thermoplastic elastomer chemically bonded to the fluorocarbon layer. Fluoropolymer layers have excellent chemical resistance.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 8. Document ID: US 4935785 A Relevance Rank: 80

Entry 16 of 17 File: USPT Jun 19, 1990

DOCUMENT-IDENTIFIER: US 4935785 A
TITLE: Electrophotographic fuser roll and fusing process

DEPR:
The surface of the fuser roll is charged by any suitable means. For example, when a polymeric material is present on the surface, a polymer electret, which is a polymer having stable electric charges embedded therein, may be formed by adding the charge chemically to the polymer by a plasma graft process. This process entails placing the polymer in a vacuum chamber, introducing into the chamber a fluorinated gas such as one or more fluorinated hydrocarbon gases, sulfur hexafluoride, or fluorine gas in an inert carrier gas such as helium or argon, and applying an rf field, typically of 10 to 100 watts, to form a plasma within the chamber generally for from about 10 seconds to abut 10 minutes, thereby generating ions and free radicals that react with the polymer to result in a polymer electret having electric charges stably embedded therein. Further information regarding plasma techniques may be found in Plasma Science and Technology by Herman V. Boenig, Cornell University Press, Ithaca (1982), and in Techniques and Applications of Plasma Chemistry by John R. Hollahan and Alexis T. Bell, John Wiley & Sons, New York (1974), the disclosures of each of which are totally incorporated herein by reference. An example of such a reaction is the treatment of the surface of a polymer such as silicone rubber with a plasma formed from exposing sulfurhexafluoride to rf power in a vacuum chamber. This process results in a fuser roll having either a positively charged or negatively charged surface, depending upon the direction of the imposed bias of the electric field, which roll will repel toner particles of the same polarity, thereby reducing or eliminating offset onto the fuser roll. Polymeric materials suitable for becoming chemically charged include tetrafluoroethylene, HTV (high temperature vulcanization-type) silicone rubber, RTV (room temperature vulcanization-type) silicone rubber, fluorinated polymers such as polytetrafluoroethylene, including Teflon.RTM., available from E. I. DuPont de Nemours and Co., Wilmington, DE, fluorocarbon elastomers, including the vinylidene fluroide-based fluoroelastomers which contain hexafluoropropylene as a comonomer, available as Viton.RTM. from E. I. DuPont de Nemours and Co., and other insulating polymers, such as a saturated hydrocarbon, including poly(isobutylene), poly(ethylene) and poly(propylene), polystyrene, polybutadiene, polynorbornadiene, a poly(arylene), such as poly(p-xylylene), a poly(ethylene terphthalate), a poly(ether ether ketone), a poly(carbonate), a poly(carbonate-co-ester), poly(sulfone), a poly(arylate), a poly(etherimide), poly(arylsulfone), a poly(ethersulfone), and a poly(amide-imide). Further information regarding the formation of polymer electrets may be found in J. E. Klemberg-Sapieha, S. Sapieha, M. R. Wertheimer, and A. Yelon, "Charge Trapping in Plasma-Polymerized Thin Films," Appl. Phys. Lett., Vol. 37, No. 1, pages 104-105 (1980), the disclosure of which is totally incorporated herein by reference.

☐ 9. Document ID: US 5722668 A Relevance Rank: 79

Entry 11 of 17 File: USPT Mar 3, 1998

DOCUMENT-IDENTIFIER: US 5722668 A
TITLE: Protective collar for vacuum seal in a plasma etch reactor

BSPR:
Numerous sealing methods have been tried in plasma etch reactors to achieve a satisfactory chamber seal. One of such sealing methods involves the cutting of grooves in the bottom rim of the aluminum top wall and the installation of gaskets made of either an elastomer or Teflon in the grooves. This sealing method turned out to be unsatisfactory for two reasons. First, since the aluminum cylindrical top wall is normally cooled and kept at a relatively low temperature, e.g. 60.degree..about.100.degree. C., fluorine and carbon ions in the reactor chamber escape through the gap between the silicon ceiling and the quartz sidewall and form a fluorocarbon polymer on the exposed bottom rim of the aluminum top wall. The fluorocarbon polymer becomes a source of particulates for the chamber and the semiconductor substrate in subsequent etching processes. Secondly, the elastomeric gaskets (typically O-rings) installed in the grooves in the bottom rim of the aluminum top wall are frequently attacked by corrosive fluorine ions or radicals and deteriorates and looses their sealing function. Additionally, the elastomeric gaskets contain relatively high levels of metal impurities which become particles in the chamber upon exposure.

BSPR:
Another sealing method that has been tried in the sealing of a plasma etch reactor chamber is the installation of an elastomeric gasket in between the contact surfaces of the silicon ceiling and the quartz sidewall. This design eliminates the process of deposition on the aluminum surface. This again turned out to be ineffective due to the presence of corrosive fluorine gas escaping from the reactor chamber through the gap between the silicon ceiling and the quartz sidewall that corrodes the gasket. The corrosion occurs even when the gaskets are molded or machined of chemical resistant fluorocarbon elastomers. Also, these materials can fail due to exposure of UV light created in the chamber.

☐ 10. Document ID: US 4973816 A Relevance Rank: 78

Entry 15 of 17 File: USPT Nov 27, 1990

DOCUMENT-IDENTIFIER: US 4973816 A
TITLE: Plasma torch with safety switch

DEPR:
Referring to the drawings, 10 represents a torch handle made of suitable insulating material. It is curved at one end and terminates in a torch head 12. Secured within the head 12 is a sleeve 14 made of a suitable conducting material such as brass. The securement is by means of a circular groove-and-ridge joint, shown at 16. Within the sleeve 14 is an insulating cylinder 18 made of a suitable material such as phenolic resin. Within the cylinder 18 there is mounted, for longitudinal sliding, a cylindrical member 20 made of suitable low friction insulating material such as a fluoro elastomer, e.g. Teflon. In the center of the head 12 is mounted a cylindrical body 22 made for example of brass. The member 20 slides in the annular space between the members 18 and 22. The body 22 is ensmalled at its end and terminates in a tube 24. Bonded at 26 to the body 22 is a nose 28, which surrounds the tube 22, leaving an annular passage 30 between the tube 24 and the nose 28. Extending into the interior of the handle is a conduit or tube 32 made for example of copper which communicates with an axial passage 34 in the center of the body 22 and tube 24. Plasma gas or other suitable fluid, as for example ambient air under pressure, flows into the tube 32, down the passage 34, and into the annular space 30. The flow then divides into two branches, one represented by a series of radial ports 36 in the nose 28--the other represented by a series of radial ports 38 also in the nose 28 and axially spaced from the ports 36. The ports 36 emerge or exit into an annular passage 40 formed between the slideable cylinder 20 and the nose 28.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 11. Document ID: US 5931201 A Relevance Rank: 77

Entry 8 of 17 File: USPT Aug 3, 1999

DOCUMENT-IDENTIFIER: US 5931201 A
TITLE: Multi-layer tubing assembly for fluid and vapor handling systems

BSPR:
Other high performance fluoropolymers, such as ethylene tetrafluoroethylene (ETFE), exhibit better cold impact-resistance but again, have experienced bonding problems. One approach in the art has been to pretreat the ETFE surface using methods such as chemical etching, plasma discharge or corona discharge. European Patent Application publication no. 0 551 094, for example, discloses a multi-layer tubing assembly in which an inner ETFE layer is treated by corona discharge to enhance bonding to an outer polyamide layer. Similarly, PCT international application WO 95/23036 treats an inner ETFE layer with plasma discharge to achieve better bonding with an outer thermosetting elastomer layer. In the same vein, U.S. Pat. No. 5,170,011 etches a fluorocarbon inner layer to promote better bonding with a polyamide outer layer. These approaches, too, have their problems. Pretreatment processes such as corona and plasma discharge are expensive and can be environmentally hazardous. Furthermore, in many cases (such as with corona treatment), only temporary bonding is achieved and delamination may occur with aging.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 12. Document ID: US 6012496 A Relevance Rank: 77

Entry 2 of 17 File: USPT Jan 11, 2000

DOCUMENT-IDENTIFIER: US 6012496 A
TITLE: Multi-layer tubing assembly for fluid and vapor handling systems

BSPR:
Other high performance fluoropolymers, such as ethylene tetrafluoroethylene (ETFE), exhibit better cold impact-resistance but again, have experienced bonding problems. One approach in the art has been to pretreat the ETFE surface using methods such as chemical etching, plasma discharge or corona discharge. European Patent Application publication no. 0 551 094, for example, discloses a multi-layer tubing assembly in which an inner ETFE layer is treated by corona discharge to enhance bonding to an outer polyamide layer. Similarly, PCT international application WO 95/23036 treats an inner ETFE layer with plasma discharge to achieve better bonding with an outer thermosetting elastomer layer. In the same vein, U.S. Pat. No. 5,170,011 etches a fluorocarbon inner layer to promote better bonding with a polyamide outer layer. These approaches, too, have their problems. Pretreatment processes such as corona and plasma discharge are expensive and can be environmentally hazardous. Furthermore, in many cases (such as with corona treatment), only temporary bonding is achieved and delamination may occur with aging.

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☐ 1. Document ID: US 5788870 A Relevance Rank: 99

Entry 1 of 6 File: USPT Aug 4, 1998

DOCUMENT-IDENTIFIER: US 5788870 A
TITLE: Promotion of the adhesion of fluorocarbon films

DEPR:
The polymeric fluorocarbon film is preferably provided by the technique disclosed in U.S. patent application Ser. No. 07/693,736 (DOCKET NO. Y0989-053), referred to hereinabove. It is most preferred that the polymeric fluorocarbon film be subsequently immediately deposited onto the treated substrate in the same apparatus employed for the above ion-bombardment treatment. In such event, it is preferred that the plasma treatment, such as the argon, be stopped by providing a flow of the fluorocarbon polymerizable gas in admixture with, for example, the argon for about 30 to about 120 seconds, an example of which is about 60 seconds, after which the argon flow is stopped. The treatment with both the gaseous polymerizable fluorocarbon and noble gas plasma allows for the deposition to begin under conditions where the metal broken bonds are available to form metal-carbon bonding. It is important to promote formation of carbide at this interface before the fluorocarbon polymerizes.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 2. Document ID: US 5055316 A Relevance Rank: 99

Entry 5 of 6 File: USPT Oct 8, 1991

DOCUMENT-IDENTIFIER: US 5055316 A
TITLE: Tight binding of proteins to surfaces

DEPR:
The kinetics of albumin adsorption to RFGD-treated surfaces and controls from 80% baboon plasma (as the albumin source) at 37.degree. C. are shown in FIGS. 1-3. FIG. 1 shows that the argon-etched PET surface had less albumin adsorbed than the untreated PET surface. FIG. 2 compares an untreated polyethylene surface with a RFGD ethylene (hydrocarbon gas) treated surface. As is seen in FIG. 2, there was more protein adsorption on the RFDG ethylene surface than on the polyethylene untreated surface, but tight binding did not result. In FIGS. 2 and 3, albumin adsorption is higher after 32 minutes to RFGD ethylene and RFGD Type III fluorocarbon as compared to polyethylene and PTFE, whereas albumin adsorption to argon-etched PET is lower than to PET at all adsorption times. The amount of albumin adsorbed to argon-etched PET increases with time, whereas the amount of albumin adsorbed to a surface for the RFGD-deposited hydrocarbon (ethylene) and fluorocarbon decreases with time as do all three control samples. FIGS. 1-3 show that the amount of albumin binding to the RFGD fluorocarbon surface in FIG. 3 is unique to that surface and is not the result of an RFGD plasma treatment, such as an etching treatment with argon on a PET or non-fluorinated polymeric surface or a depositing treatment with the hydrocarbon ethylene.

☐ 3. Document ID: US 5456327 A Relevance Rank: 85

Entry 2 of 6 File: USPT Oct 10, 1995

DOCUMENT-IDENTIFIER: US 5456327 A
TITLE: O-ring seal for rock bit bearings

DEPR:
Such potential copolymers are grafted to the nitrile polymer by high energy plasma treatment. A high energy plasma comprises a highly ionized and accelerated gas, typically, an inert gas such as argon, nitrogen or the like. Other gaseous species such as a fluorocarbon polymer may be introduced into such a plasma. When such highly energetic polymers encounter the elastomeric nitrile rubber, bonds in the nitrile and in the fluorocarbon or the like may be disrupted, thus, providing an opportunity for molecularly bonding the fluorocarbon to the nitrile substrate. This, of course, changes the surface properties of the O-ring without changing its bulk properties.

☐ 4. Document ID: US 5201903 A Relevance Rank: 83

Entry 3 of 6 File: USPT Apr 13, 1993

DOCUMENT-IDENTIFIER: US 5201903 A
TITLE: Method of making a miniature multi-conductor electrical cable

DEPR:
Alternatively, the primary insulation layer 14 may be of a polytetrafluoroethylene (PTFE) material such as a PTFE emulsion available from the DuPont Corporation under the trademark TEFLON, or other fluorocarbon polymers, including perfluorinated ethylene-propylene copolymer (FEP) and perfluorinated ethylene-vinyl alkoxy ether copolymer (PFA) applied by known small particle dispersion coating techniques. Satisfactorily applying a secondary insulation layer 16 adherently over a primary layer 14 of polymeric fluorocarbon material is usually difficult, requiring techniques such as etching the surface of the fluorocarbon material to enhance bonding. For that reason, the secondary layer 16 may be omitted when a primary layer 14 is formed of such polymeric fluorocarbon materials as PTFE in an adequate thickness, such as 4 to 6 microns, to reliably insulate the individual conductor 12 electrically. It is also possible to prepare the outer surface of a primary layer 14 of a polymeric fluorocarbon by plasma treatment, after which a secondary layer 16 can be applied.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 5. Document ID: US 5002794 A Relevance Rank: 71

Entry 6 of 6 File: USPT Mar 26, 1991

DOCUMENT-IDENTIFIER: US 5002794 A
TITLE: Method of controlling the chemical structure of polymeric films by plasma

DEPR:
Depositions were done at these conditions for 20 min. while the substrate temperature was ramped from room temperature to -80.degree. C. These depositions were done on Teflon.TM. because it gives a characteristic substrate XPS spectrum that is free of oxygen and hydrocarbon contamination. Hence, any oxygen and hydrocarbon signals from the treated samples can be associated with the plasma treatment. FIG. 4 shows the progression of C1s XPS spectra as the substrate temperature is reduced. The extra peak at a binding energy of 292.0 eV in the sample deposited at the lowest temperature is due to the Teflon substrate. This may indicate that the deposition rate for acetone decreases with decreasing temperature. This may be related to volatilization of a portion of the coating when the substrate temperature is increased after the deposition. These phenomena may be important in the deposition of high quality films, especially for nonpolymerizable precursors.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 6. Document ID: US 5153072 A Relevance Rank: 71

Entry 4 of 6 File: USPT Oct 6, 1992

DOCUMENT-IDENTIFIER: US 5153072 A
TITLE: Method of controlling the chemical structure of polymeric films by plasma deposition and films produced thereby

DEPR:
Depositions were done at these conditions for 20 min. while the substrate temperature was ramped from room temperature to -80.degree. C. These depositions were done on Teflon.TM. because it gives a characteristic substrate XPS spectrum that is free of oxygen and hydrocarbon contamination. Hence, any oxygen and hydrocarbon signals from the treated samples can be associated with the plasma treatment. FIG. 4 shows the progression of C1s XPS spectra as the substrate temperature is reduced. The extra peak at a binding energy of 292.0 eV in the sample deposited at the lowest temperature is due to the Teflon substrate. This may indicate that the deposition rate for acetone decreases with decreasing temperature. This may be related to volatilization of a portion of a coating when the substrate temperature is increased after the deposition. These phenomena may be important in the deposition of high quality films, especially for nonpolymerizable precursors.

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Document Number 1

Entry 2 of 2 File: DWPI Aug 31, 1995

DERWENT-ACC-NO: 1995-311413
DERWENT-WEEK: 199932

TITLE: Layered prod, having chemical bonds between the layers, prepn - by forming a fluoropolymer substrate and layering with thermosetting polymers or thermoplastic elastomers
INVENTOR: KRAUSE, E K; KUENZEL, K J ; WOODWARD, F ; WOODWARD, F D

PRIORITY-DATA:
1994US-0200941 February 23, 1994

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 9523036 A1	August 31, 1995	E	037	B05D003/02
AU 9473168 A	September 11, 1995	N/A	000	B05D003/02
BR 9408554 A	August 5, 1997	N/A	000	B05D003/02
AU 681898 B	September 11, 1997	N/A	000	B05D003/02
JP 09509377 W	September 22, 1997	N/A	035	B32B027/30
EP 814917 A1	January 7, 1998	E	000	B05D003/02
KR 97701103 A	March 17, 1997	N/A	000	B05D003/02
ES 2116948 T1	August 1, 1998	N/A	000	B05D003/02

INT-CL (IPC): B05D 3/02; B05D 3/06; B05D 5/12; B29D 22/00; B32B 27/00; B32B 27/30

ABSTRACTED-PUB-NO: WO 9523036A
BASIC-ABSTRACT:

A method of preparing a layered prod. comprises: (a) forming a fluoropolym er substrate; and (b) layering with a polymer selected from thermosetting polymers and thermoplastic elastomers. Chemical bonds are formed between the layers. Also claimed are the following: (1) a tube consisting of an inner fluoropolymer layer, and a layer of a selected polymer applied and chemically bonded to an outer surface of the inner layer; and (2) a layered prod..

USE - The prods. are fluoropolymer hoses and tubes such as composite pipes, e.g. those used in fuel lines.

ADVANTAGE - The fluoropolymer substrate can be activated by subjecting it to a charged gaseous atmos. formed by electrically ionizing a gas which contacts the substrate (claimed). This serves to increase the strength of the chemical bond between the layers. The inner fluorocarbon layer of fuel pipes has an electrostatic discharge resistance and hydrocarbon evaporative emission resistance.

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Document Number 1

Entry 2 of 2 File: DWPI Aug 31, 1995

DERWENT-ACC-NO: 1995-311413
DERWENT-WEEK: 199932

TITLE: Layered prod, having chemical bonds between the layers, prepn - by forming a fluoropolymer substrate and layering with thermosetting polymers or thermoplastic elastomers
INVENTOR: KRAUSE, E K; KUENZEL, K J ; WOODWARD, F ; WOODWARD, F D

PRIORITY-DATA:
1994US-0200941 February 23, 1994

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 9523036 A1	August 31, 1995	E	037	B05D003/02
AU 9473168 A	September 11, 1995	N/A	000	B05D003/02
BR 9408554 A	August 5, 1997	N/A	000	B05D003/02
AU 681898 B	September 11, 1997	N/A	000	B05D003/02
JP 09509377 W	September 22, 1997	N/A	035	B32B027/30
EP 814917 A1	January 7, 1998	E	000	B05D003/02
KR 97701103 A	March 17, 1997	N/A	000	B05D003/02
ES 2116948 T1	August 1, 1998	N/A	000	B05D003/02

INT-CL (IPC): B05D 3/02; B05D 3/06; B05D 5/12; B29D 22/00; B32B 27/00; B32B 27/30

ABSTRACTED-PUB-NO: WO 9523036A
BASIC-ABSTRACT:

A method of preparing a layered prod. comprises: (a) forming a fluoropolym er substrate; and (b) layering with a polymer selected from thermosetting polymers and thermoplastic elastomers. Chemical bonds are formed between the layers. Also claimed are the following: (1) a tube consisting of an inner fluoropolymer layer, and a layer of a selected polymer applied and chemically bonded to an outer surface of the inner layer; and (2) a layered prod..

USE - The prods. are fluoropolymer hoses and tubes such as composite pipes, e.g. those used in fuel lines.

ADVANTAGE - The fluoropolymer substrate can be activated by subjecting it to a charged gaseous atmos. formed by electrically ionizing a gas which contacts the substrate (claimed). This serves to increase the strength of the chemical bond between the layers. The inner fluorocarbon layer of fuel pipes has an electrostatic discharge resistance and hydrocarbon evaporative emission resistance.

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Document Number 9

Entry 4 of 40 File: DWPI Feb 11, 1999

DERWENT-ACC-NO: 1999-133641
DERWENT-WEEK: 199912

TITLE: Bonding of fluorocarbon part(s) esp. sealing ring to support - uses plasma treatment to activate bonding part of surface, avoiding chemical etching and associated problems in disposal of etching fluid
INVENTOR: GUST, H

PRIORITY-DATA:
1997DE-1034330 August 8, 1997

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
DE 19834065 A1	February 11, 1999	G	007	C08L027/12

INT-CL (IPC): C08J 3/28; C08L 27/12; C08L 27/14; C08L 27/16; C08L 27/18; C08L 27/20; C08L 81/04; C09K 3/10

ABSTRACTED-PUB-NO: DE19834065A
BASIC-ABSTRACT:

A polyfluorocarbon part (6) is attached to a support (1) by a joint in which at least the joining region (7) has been activated by plasma treatment.

USE - Bonding of fluorocarbon parts especially sealing rings, to a carrier.

ADVANTAGE - Avoids chemical etching and associated disposal problems of etching fluids.

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DOCUMENT-IDENTIFIER: US 5051259 A
TITLE: Skin barrier product with discontinuous adhesive layer

DEPR:
By producing blanks for sealing rings for ostomy pouches as explained in connection with FIG. 8 and FIG. 9 there is achieved the advantage of avoiding the waste of material that will inevitably occur in the known production of such sealing rings by punching from sheets or lengths of the skin adhesive.

CCXR:
428/66.4

Terms	Documents
l1 and sealing ring	4

☐ 2. Document ID: US 5874170 A Relevance Rank: 72

Entry 1 of 4 File: USPT Feb 23, 1999

DOCUMENT-IDENTIFIER: US 5874170 A
TITLE: Seal for movable structural components

BSPR:
EP 0 615 085 discloses an integrated shaft sealing ring which comprises a carrier body in the form of light die cast metal and a sealing member made of polytetrafluoroethylene (PTFE) and vulcanized to the carrier body through an elastomer.

CCXR:
428/66.4

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 3. Document ID: US 5112901 A Relevance Rank: 70

Entry 2 of 4 File: USPT May 12, 1992

DOCUMENT-IDENTIFIER: US 5112901 A
TITLE: Sealing elements and plain bearings formed from fiber-reinforced plastics

DEPR:
A hybrid yarn 1 mm in diameter produced as described in EP-A-156 599 from 40% by volume of polyether ether ketone fibers and 60% by volume of carbon fibers is wound onto a graphite shaft 50 mm in diameter. To delimit the wound structure at the side, two flanges have been mounted on the shaft 9 mm apart. Separating films are placed between the wound structure and each flange. Hybrid yarn is wound onto the shaft until the wound structure has attained a thickness of 100 mm (outer diameter). The flanges are then pressed together at 420.degree. C. and 19 bar for 1 hour to a distance between them of 7 mm. After cooling, the separating film is easy to remove. The compact sealing ring produced is removed from the shaft and machined until its dimensions are an outer diameter of 76 mm, an inner diameter of 50 mm and a width of 6.5 mm.

CCXR:
428/66.4

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Image

☐ 4. Document ID: US 5051259 A Relevance Rank: 69

Entry 3 of 4 File: USPT Sep 24, 1991

Search Results - Record(s) 1 through 4 of 4 returned.

☐ 1. Document ID: US 4540035 A Relevance Rank: 72

Entry 4 of 4 File: USPT Sep 10, 1985

DOCUMENT-IDENTIFIER: US 4540035 A
TITLE: Tire repair patch

CLPR:
2. The tire patch recited in claim 1 wherein said lower face which is adapted for sealing said ring to a tire is convex to conform to the shape of the inner surface of said tire.

CLPR:
3. The tire patch recited in claim 1 further comprising a thin outer elastomeric layer encasing said closed cell elastomeric annular sealing ring and cover portions.

CLPR:
4. The tire patch recited in claim 1 further comprising a thin flexible auxiliary sealing ring projecting outwardly and downwardly from the lower portion of the periphery of said thick ring portion.

CLPV:
(a) a thick highly compliant annular sealing ring made from a soft resilient air impervious closed cell elastomeric material, said annular sealing ring having parallel upper and lower annular faces, the lower of said faces being adapted to adhesively bond said face to the inner surface of a tire; and

CLPV:
(b) a thin air impervious cover attached to the upper face of the sealing ring, said cover subtending the center aperture of the annular sealing ring.

CLPV:
(a) a thick highly compliant annular sealing ring made from a soft resilient air impervious closed cell elastomeric material, said annular sealing ring having parallel upper and lower faces;

CLPV:
(c) a thin air impervious cover adjoining the upper face of the outer annular sealing ring, said cover subtending a center aperture of the annular sealing ring.

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